

CLAIMS

- Calda 31
Sub 02
1. Method for controlling a yarn processing system comprising a yarn consuming textile machine (L), a yarn feeding device (F) upstream of the textile machine, and a supply spool (B) upstream of the yarn feeding device, said yarn feeding device pulling off a yarn (Y) from said supply spool with varying speed to form and maintain a yarn intermediate store by means of a controlled winding drive in said yarn feeding device which yarn intermediate store serves to cover the yarn consumption demand of the textile machine at any time, **characterised in that** a rotatable supply spool (B) is rotated by means of the yarn (Y) at least by the yarn tension generated by said winding drive (4), and that during rotation of said supply spool (B) said yarn (Y) is released tangentially from said supply spool (B).
 2. Method as in claim 1, **characterised in that** the rotational resistance of said supply spool (B) which is to be overcome via said yarn (Y) by said winding drive (4) is actively regulated preferably to achieve an essentially constant yarn tension, and/or preferably essentially synchronously with controlled speed variations of said winding drive (4).
 3. Method as in claim 2, **characterised in that** the yarn tension is detected and that the rotational resistance of the supply spool (B) is regulated according to a set reference yarn tension.
 4. Method as in claim 2, **characterised in that** the rotational resistance of said supply spool (B) which is to be overcome by said winding drive (4) is regulated by actively driving said supply spool in conveying direction, preferably only partially.
 5. Method as in claim 2, **characterised in that** said rotational resistance of said supply spool (B) is increased by active braking of the supply spool to its stand still condition when said winding drive (4) is switched off.
 6. Method as in claim 5, **characterised in that** the switched off winding drive (4) is stopped via the yarn (Y) by the braking of the supply spool (B).

7. Method as in claim 2, **characterised in that** an actuation current for said winding drive (4) in said yarn feeding device (F) is controlled with the help of yarn sensor signals monitoring a predetermined size range of said yarn store in said yarn feeding device (F), and that said rotational resistance of a spool body of said supply spool (B) is regulated on the basis of said yarn sensor signals or on the basis of run or stop signals (S1, S2) representing said actuation current.
8. Method as in claim 2, **characterised in that** the rotational resistance of said supply spool (B) is varied between a free running condition and a complete stand still condition, and that to achieve the stand still condition of said supply spool said rotational resistance is increased on the basis of a yarn sensor signal or said stop signal (S2) or a currentless condition of said drive motor, respectively, each representing a winding drive stop.
9. Method as in claim 8, **characterised in that** said rotational resistance of said supply spool (B) is increased with an adjustable delay (V') in relation to the occurrence of said yarn sensor signal or said stop signal (S2), respectively, or along a selected ramp function.
10. Method as in claim 2, **characterised in that** said rotational resistance of said supply spool (B) is decreased at the occurrence of said yarn sensor signal or said run signal (S1) for accelerating the winding drive (4), or earlier.
11. Yarn processing system including a yarn consuming textile machine (L), a yarn feeding device (F) provided upstream of said textile machine, and a supply spool (B) provided upstream of said yarn feeding device, said yarn feeding device having a winding drive (4) controlled by a control device (C) which winding drive (4) forms a varying yarn store (7) in said yarn feeding device (F) covering consumption demand at any time, **characterised in that** said supply spool (B) is positioned in relation to said yarn feeding device (F) for a tangential release of said yarn (Y), that said supply spool (B) is rotatable, and that said winding drive (4) of said yarn feeding device (F) constitutes a rotational drive for said supply spool (B) by use of the generated yarn tension.

12. System as in claim 11, **characterised in that** said supply spool (B) comprises a device (D) for varying the rotational resistance of said supply spool (B).
13. System as in claim 12, **characterised in that** said device (D) includes a slip rotational drive (5, 20) for said supply spool (B).
14. System as in claim 13, **characterised in that** said slip rotational drive (5, 20) is adjustable between a conveying operation mode generating lower driving torque than the torque generated at said supply spool (B) by said yarn tension, and a braking operation mode, preferably to generate a braking torque (24) sufficient to stop said supply spool (B) by said braked yarn (Y).
15. System as in claim 11, **characterised in that** an electromotor of said winding drive (4) of said yarn feeding device (F) is designed with increased performance efficiency in view to the necessary yarn tension in the yarn (Y) unspooled from said supply spool (B) for driving said supply spool (B) compared to a performance efficiency necessary for a pure consumption depending operation of said yarn feeding device.
16. System as in claim 12, **characterised in that** said device (D) is a braking device (12, 14, 15) of said supply spool (B) which braking device can be engaged and disengaged in controlled fashion.
17. System as in claim 16, **characterised in that** a yarn sensor (6) is provided in said yarn feeding device for monitoring at least the maximum size of said yarn store (7) and for generating signals, said yarn sensor (6) co-operating with said control device (C) of said winding drive (4) for switching off the actuation current of the drive motor, and that said braking device is at least engageable upon occurrence of the signals of said maximum yarn sensor or upon occurrence of a stop signal (S2) for said drive motor.
18. System as in claim 17, **characterised in that** a yarn sensor (6) is provided in said yarn feeding device (F) for monitoring a minimum size of said yarn store (7),

which yarn sensor (6) co-operates with said control device (C) for controlling the actuation current of the drive motor of said winding drive (4), and that said braking device is disengageable upon occurrence of the signals of said minimum size yarn sensor (6) or of the run signal (S1) for the motor, respectively.

19. System as in claim 17, **characterised in that** said braking device (D) is engageable with an adjustable delay (V') in relation to the occurrence of the signal of the maximum size yarn sensor (6) or of said stop signal (S2) for the drive motor.
20. System as in claim 17, **characterised in that** said braking device comprises a friction element (14) acting on a braking element (12) of said supply spool (B), which friction element (14) is adjustable by a controlled driving device (15), between engagement and disengagement or release positions, preferably by a pneumatic cylinder or a spring accumulator cylinder.
21. System as in at least one of claims 17 or 18, **characterised in that** said run signal or stop signal is detected at said yarn feeding device in a countless fashion and without a galvanic connection by means of an external pick-up head (P).
22. System as in at least one of claims 11 to 21, **characterised by** its use for processing yarn materials of high tensile strength like carbon fibres or the like for weaving functional reinforcing fabrics.